

REMARKS

Applicants respectfully request reconsideration of the present application in view of the reasons that follow.

Claim Rejections – 35 USC §103

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto (US Patent No. 6, 188,921) in view of Christopherson (US Patent No. 6, 339,047) and Kazuhisa (JP408106823). This rejection is respectfully traversed.

Claim 1 recites, a superconducting wire, comprising an oxide superconductor and a cladding metal for cladding said oxide superconductor, a material of said cladding metal having a breaking strain of at least 30% in a stress-strain test; and wherein the material of said cladding metal is silver having an impurity concentration of 10 ppm to 500 ppm. (*emphasis added*)

Otto, Christopherson, and Kizuhisa fail to teach or suggest at least the above recited features of claim 1. In particular, Otto teaches attaching a stiff mechanical support to monofilament tapes on the superconducting phase on one or both sides (column 6, lines 23-27). The stiff mechanical support in Otto is used to avoid the introduction of defects into the superconductor phase. Nonetheless, the Office Action of July 7, 2009 incorrectly reasons, "That means the cladding material should be selected such that it will be able to withstand the stress/strain without passing it to the superconducting phase." However, a person skilled in the art will ordinarily select material having a high maximum stress (high mechanical strength) as the cladding material. In a typical metal or alloy, a higher maximum stress tends to have a lower breaking strain (see page 12, lines 11-13 of the specification of the Original Specification).

The subject matter of the rejected claims (including the above cited features of claim 1) is not disclosed or suggested by Otto. Applicants submit herewith a Declaration under 37 CFR 1.132 to expedite an allowance of the application. In particular, the experiments conducted by the Applicants show that the cladding material of Otto would not have the

breaking strain of at least 30% in the stress-strain test. The experiments show that maximum stress and breaking strain of a silver wire are inversely proportional. (Applicant's Declaration paragraph 11, and Fig. 3) As discussed above, a person of ordinary skill in the art would be inclined to select the material having a high maximum stress. Since high maximum stress is inversely proportional to the breaking strain, the material in Otto would not have the breaking strain of at least 30% in the stress-strain test. Instead, Otto discloses a fracture strains of 0.5% or preferably higher than 1% for practical handling of the superconducting composite. (Column 1, line 18-20) However, claim 1 recites a breaking strain percentage that is at least at least 30 times greater than Otto.

Various advantages may be realized by using a material having breaking strain of at least 30%. It is shown that superconducting multifilament wires of Comparative Examples 1 to 5, which used the silver and/or silver alloy pipes having breaking strain of less than 30%, suffered numerous cracks caused by drawing during the steps of manufacturing the same. However, superconducting multifilament wires of Examples 1 to 5, which used the silver and/or silver alloy pipes having breaking strain of at least 30%, suffered no crack caused by drawing during the steps of manufacturing the same (see on page 19, lines 6 to 12 of the English translation of the specification).

Moreover, Otto fails to teach, suggest or render predictable a silver cladding metal having an impurity concentration of 10 ppm to 500 ppm. Christopherson is cited in the Office Action as addressing distinctions of Otto and the claimed features. However, Christopherson does not address the distinction noted above with reference to independent claim 1. Specifically, Christopherson does not teach, suggest or render predictable a silver cladding metal having an impurity concentration of 10 ppm to 500 ppm.

Instead, while Christopherson teaches that high-purity silver usually contains some amount of impurity (Col. 4, ll. 14-16), Christopherson fails to disclose the claimed numerical range of the impurity concentration or its effect. As recited in the original specification the undesirable processing cracks in the superconducting wire can be reduced by controlling the purity level. (Page 19, line 25 to page 20, line 5) Specifically impurity concentrations below and above the claimed range created greater processing cracks. (Page 18, Table 1, Examples

6 through 10) In particular example 6 through 10 use different levels of impurity concentrations and cracks occurred at an impurity concentration of 5 ppm and 1000 ppm. (Original Specification, page 19, line 25 to page 20 line 3) These advantages relating to the purity of silver were not recognized by Christopherson.

Moreover, Christopherson fails to teach, suggest or render predictable a cladding metal having a breaking strain of at least 30% in a stress-strain test. The disclosure of Christopherson fails to provide the motivation for the features of claim 1.

Similary, Kazuhisa fails to address the above mentioned distinctions between claim 1 and the Otto and Christopherson references. Kazuhisa teaches a silver pipe of 99.998% purity filled up with powder. However, Kazuhisa fails to teach, suggest or render predictable a cladding metal having a breaking strain of at least 30% in a stress-strain test. The disclosure of Kazuhisa fails to provide the motivation for the features of claim 1.

Therefore, claim 1 is believed to be allowable. Because claims 2-7 depend from claim 1 they are believed to be allowable for at least the same reasons claim 1 is believed to be allowable.

Concluding Remarks

Claims 1-7 are pending in this application.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely

acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

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Respectfully submitted,

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